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IMPLEMENTATION PLAN REVIEW FOR GUAM AS REQUIRED BY THE
ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

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**IMPLEMENTATION PLAN REVIEW
FOR
GUAM
AS REQUIRED
BY
THE ENERGY SUPPLY
AND
ENVIRONMENTAL COORDINATION ACT**



U. S. ENVIRONMENTAL PROTECTION AGENCY

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FOR
GUAM
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PREPARED BY THE FOLLOWING TASK FORCE:

U. S. Environmental Protection Agency, Region IX
100 California Street
San Francisco, California 94111

Environmental Services of TRW, Inc.
(Contract 68-02-1385)

U. S. Environmental Protection Agency
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

February 1975

TERRITORY OF GUAM
ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT
(SECTION IV - STATE IMPLEMENTATION PLAN REVIEW)

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1.0 EXECUTIVE SUMMARY

The enclosed report is the U.S. Environmental Protection Agency's (EPA) response to Section IV of the Energy Supply and Environmental Coordination Act of 1974 (ESECA). Section IV requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interfering with the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). In addition to requiring that EPA report to the State on whether control regulations might be revised, ESECA provides that EPA must approve or disapprove any revised regulations relating to fuel combustion stationary sources within three months after they are submitted to EPA by the States. The States may, as in the Clean Air Act of 1970, initiate State Implementation Plan revisions; ESECA does not, however, require States to change any existing plan.

Congress has intended that this report provide the State with information on excessively restrictive control regulations. The intent of ESECA is that SIP's, wherever possible, be revised in the interest of conserving low sulfur fuels or converting sources which burn oil or natural gas to coal. EPA's objective in carrying out the SIP reviews, therefore, has been to try to establish if emissions from combustion sources may be increased. Where an indication can be found that emissions from certain fuel burning sources can be increased and still attain and maintain NAAQS, it may be plausible that fuel resource allocations can be altered for "clean fuel savings" in a manner consistent with both environmental and national energy needs.

In many respects, the ESECA SIP reviews parallel EPA's policy on clean fuels. The Clean Fuels Policy has consisted of reviewing implementation plans with regards to saving low sulfur fuels and, where the primary sulfur dioxide air quality standards were not exceeded, to encourage States to either defer compliance regulations or to revise the SO₂ emission regulations. The States have also been asked to discourage large scale shifts from coal to oil where this could be done without jeopardizing the attainment and maintenance of the NAAQS.



To date, EPA's fuel policy has addressed only those States with the largest clean fuels saving potential. Several of these States have or are currently in the process of revising SO₂ regulations. These States are generally in the Eastern half of the United States. ESECA, however, extends the analysis of potentially over-restrictive regulations to all 55 States and territories. In addition, the current reviews address the attainment and maintenance of all the National Ambient Air Quality Standards.

There are, in general, three predominant reasons for the existence of overly restrictive emission limitations within the State Implementation Plans. These are 1) The use of the example region approach in developing State-wide air quality control strategies; 2) the existence of State Air Quality Standards which are more stringent than NAAQS; and 3) the "hot spots" in only part of an Air Quality Control Region (AQCR) which have been used as the basis for controlling the entire region. Since each of these situations affect many State plans and in some instances conflict with current national energy concerns, a review of the State Implementation Plans is a logical follow-up to EPA's initial appraisal of the SIP's conducted in 1972. At that time SIP's were approved by EPA if they demonstrated the attainment of NAAQS or more stringent state air quality standards. Also, at that time an acceptable method for formulating control strategies was the use of an example region for demonstrating the attainment of the standards.

The example region concept permitted a State to identify the most polluted air quality control region (AQCR) and adopt control regulations which would be adequate to attain the NAAQS in the region. In using an example region, it was assumed that NAAQS would be attained in the other AQCR's of the State if the control regulations were applied to similar sources. The problem with the use of an example region is that it can result in excessive controls, especially in the utilization of clean fuels, for areas of the State where sources would not otherwise contribute to NAAQS violations. For instance, a control strategy based on a particular region or source can result in a regulation requiring 1 percent sulfur oil to be burned state-wide where the use of 3 percent sulfur coal would be adequate to attain NAAQS in some locations.

EPA anticipates that a number of States will use the review findings to assist them in making the decision whether or not to revise portions of their State Implementation Plans. However, it is most important for those States which desire to submit a revised plan to recognize the review's limitations. The findings of this report are by no means conclusive and are neither intended or adequate to be the sole basis for SIP revisions; they do, however, represent EPA's best judgement and effort in complying with the ESECA requirements. The time and resources which EPA has had to prepare the reports has not permitted the consideration of growth, economics, and control strategy tradeoffs. Also, there has been only limited dispersion modeling data available by which to address individual point source emissions. Where the modeling data for specific sources were found, however, they were used in the analysis.

The data upon which the reports' findings are based is the most currently available to the Federal Government. However, EPA believes that the States possess the best information for developing revised plans. The States have the most up-to-date air quality and emissions data, a better feel for growth, and the fullest understanding for the complex problems facing them in the attainment and maintenance of air quality standards. Therefore, those States desiring to revise a plan are encouraged to verify and, in many instances, expand the modeling and monitoring data supporting EPA's findings. In developing a suitable plan, it is suggested that States select control strategies which place emissions from fuel combustion sources into perspective with all sources of emissions such as smelters or other industrial processes. States are encouraged to consider the overall impact which the potential relaxation of overly restrictive emission regulations for combustion sources might have on their future control programs. This may include air quality maintenance, prevention of significant deterioration, increased TSP, NO_x and HC emissions which occur in fuel switching, and other potential air pollution problems such as sulfates.

Although the enclosed analysis has attempted to address the attainment of all the NAAQS, most of the review has focused on total suspended particulate matter (TSP) and sulfur dioxide (SO_2) emissions. This is

because stationary fuel combustion sources constitute, in many areas, a major source of SO₂ and TSP emissions.

Part of each State's review was organized to provide an analysis of the SO₂ and TSP emission tolerances within each of the various AQCR's. The regional emission tolerance estimate is, in many cases, EPA's only measure of the "over-cleaning" accomplished by a SIP. The tolerance assessments have been combined in Appendix B with other regional air quality indicators in an attempt to provide an evaluation of a region's candidacy for changing emission limiting regulations. In conjunction with the regional analysis, a summary of the State's fuel combustion sources (power plants, industrial sources and area sources) has been carried out in Appendices C, D and E.

The Territory of Guam Implementation Plan has been reviewed for the most frequent causes of over-restrictive emission limiting regulations. The findings are as follows:

- There is no indication that current regulations are overly restrictive in the context of Section IV of ESECA.
- The Example Region approach was not used in developing control strategies for TSP and SO₂.
- There are indications that the NAAQS for both TSP and SO₂ are being violated.

2.0 GUAM STATE IMPLEMENTATION PLAN REVIEW

2.1 SUMMARY

A revision of fuel combustion source emissions regulations will depend on many factors. For example:

- Does the State have air quality standards which are more stringent than NAAQS?
- Does the State have emission limitation regulations for control of (1) power plants, (2) industrial sources, (3) area sources?
- Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?
- Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?
- Are there no proposed Air Quality Maintenance Areas?
- Are there indications of a sufficient number of monitoring sites within a region?
- Is there an expected 1975 attainment date for NAAQS?
- Based on reported (1973) air quality data, does air quality meet NAAQS?
- Based on reported (1973) air quality data, are there indications of a tolerance for increased emissions?
- Are the total emissions from stationary fuel combustion sources proportionally lower than those of all other sources?
- Is there a significant clean fuels saving potential in the region?
- Must emission regulations be revised to accomplish significant switching?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?

The following portion of this report is directed at answering these questions. An AQCR's potential for revising regulations increases when there are affirmative responses to the above.

The initial part of the SIP review report, Section 2 and Appendix A, was organized to provide the background and current situation information for the State Implementation Plan. Section 3 and the remaining Appendices provide an AQCR analysis which helps establish the overall potential for

revising regulations. Emission tolerance estimates have been combined in Appendix B with other regional air quality indicators in an attempt to provide an evaluation of a region's candidacy for revising emission limiting regulations. In conjunction with the regional analysis, a characterization of the State's fuel combustion sources (power plants, industrial sources and area sources) has been carried out in Appendices C, D and E.

Based on an overall evaluation of EPA's current information, AQCR's have been classified as good, marginal or poor candidates for regulation revisions. The following table summarizes the State Implementation Plan Review. The remaining portion of the report supports this summary with explanations.

STATE IMPLEMENTATION PLAN REVIEW

(SUMMARY)

"INDICATORS"	STATE	
	TSP	SO ₂
• Does the State have air quality standards which are more stringent than NAAQS?	No	Yes ^a
• Does the State have emission limiting regulations for control of:		
1. Power plants	No	Yes
2. Industrial sources	Yes	Yes
3. Area sources	Yes	Yes
• Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?	No	No
• Has the State <u>not</u> initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?	Yes	Yes
• Are there <u>no</u> proposed Air Quality Maintenance Areas?	Yes	Yes
• Are there indications of a sufficient number of monitoring sites within a region?	N/A	N/A
• Is there an expected 1975 attainment date for NAAQS?	No	Yes
• Based on reported (1973) Air Quality Data, does air quality meet NAAQS?	No	No
• Based on reported (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?	No	No
• Are the total emissions from stationary fuel combustion sources lower than those of other sources?	Yes	No
• Do modeling results for specific fuel combustion sources show a potential for a regulation revision?	N/A	No
• Must emission regulations be revised to accomplish significant fuel switching?	N/A	N/A
• Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations?	Poor	Poor
• Is there a significant Clean Fuels Saving potential in the region?	No	No

^a The Territory's SO₂ standards are identical to the former secondary NAAQS for SO₂.

2.2 AIR QUALITY SETTING - TERRITORY OF GUAM

The Territory of Guam, consisting of a small tropical island in the Pacific Ocean, is contained within one Air Quality Control Region (#246). Presently, the Territory is classified Priority II for sulfur oxides and Priority III for all other pollutants, but these priorities will be changed to IA for TSP and SO₂. There are no proposed Air Quality Maintenance Area designations for any pollutant.

The ambient air quality standards for the Territory are presented in Table A-3.

From the most currently available air quality data (1973), it appears that TSP and SO₂ concentrations have exceeded the national standards. Sources of particulate emissions include fugitive dust, process losses and incineration, while electric power generating facilities are the major source of SO₂ emissions.

2.3 BACKGROUND ON THE DEVELOPMENT OF THE CURRENT STATE IMPLEMENTATION PLAN

The original Guam SIP was based on estimated air quality data using the Miller and Holzworth Area Model. Actual data obtained since the adoption of the original SIP indicates that this SIP would be inadequate to attain and maintain national ambient air quality standards. As a result, the SIP is currently being revised to take into account this air quality data.

2.3.1 Particulate Control Strategy

The original (and official) control strategy is comprised of the following control measures:

- (1) Process weight table.
- (2) Fugitive dust control.
- (3) Ban on open burning.
- (4) Incineration limitation of 0.20 lbs/100 lbs of refuse as charged.

The revised SIP contains more stringent controls on fugitive dust than the original.

2.3.2 Sulfur Oxide Control Strategy

The original (and official) control strategy is comprised of an emission limitation of 1.94 lbs SO₂/million Btu heat input to the installation. The revised strategy is comprised of an emission limitation of 0.80 lbs SO₂/million

Btu heat input to the installation. EPA is in the process of preparing a Federal Register notice to approve this portion of the revised SIP.

EPA is also in the process of evaluating alternatives which could be used to meet the 0.80 lbs emission limitation and those measures which could be used on an interim basis to meet the ambient standards.

2.4 SPECIAL CONSIDERATIONS - TERRITORY OF GUAM

The only problem with the SIP is with its implementation, because the low sulfur fuel which would be required to meet the SO₂ emission limitation without additional controls is not available.

3.0 AQCR ASSESSMENTS

Power Plant Analysis

Table C-1 estimates the effect when all power plants which burn residual oil conform to SO₂ emission limitations specified in the SIP. Because the power plants currently burn only oil and do not have the capability of using coal without extensive modification, no analysis was made of the consequences of switching to coal.

Industrial/Commercial/Institutional Source Assessment

The Territory of Guam was found to have no industrial, commercial and institutional sources which could be evaluated in the context of Section 4 of ESECA.

Area Source Assessment

The Territory of Guam was found to have no area sources which could be evaluated in the context of Section 4 of ESECA.

APPENDIX A

- State implementation plan information
- Current air quality information
- Current emission information

Tables in this appendix summarize original and modified state implementation plan information, including original priority classifications, attainment dates, ambient air quality standards and fuel combustion emission regulations. Air quality data for SO₂ and TSP monitoring stations are shown for AQCR's in the state. Emission data are tabulated and are broken down into fuel burning categories.

Tables A-9 and A-10 show a comparison of emission inventories in the original SIP and those from more current data. An emission tolerance, or emission tonnage which might be allowed in the AQCR and still not violate national secondary ambient air quality standards, is shown for SO₂ and particulates. Tolerance was based on either the degree of control expected by the SIP or upon air quality/emission relationships which are calculated from more recent data. The value of the emission tolerance provides an indication of the degree of potential an AQCR possesses for fuel revisions and regulation relaxation.

Methodology for Increased Emissions Tolerance

A tolerance for increased emissions was determined as follows. First, an "allowable emissions" was calculated for each AQCR based on the current emissions data and the percent reduction (or increase) required to meet the national secondary ambient air quality standards in that AQCR (worst case from Tables A-4 and A-5). This "allowable" was then compared to that from the SIP. If reasonable agreement occurred, then the "estimated emissions" which would result after implementation of the SIP in that AQCR was used to calculate an emissions tolerance. Thus, some credit could be given to an AQCR which might be restricting emissions more than required by ambient air quality standards. For instance, emission controls applied to AQCR's

for the state may reduce emissions well below the allowables. In the event that no data existed or was available from the SIP for an AQCR, the current air quality was used to assign emission tolerances based on proportional rollback or rollup. Current air quality was also the criteria, if emissions data from SIP and current emissions data did not appear to be comparable (this was often the case).

When no SIP emissions data was available and current air quality levels were less than one half of the level represented by an ambient air quality standard, no "rollup" emission tolerance was calculated in Tables A-9 and A-10. This arbitrary cutoff point was chosen so as not to distort the emission tolerance for an area. At low levels of a pollutant, the relationship between emissions and air quality is probably not linear.¹ Although this cutoff may leave some AQCR's with no quantifiable emissions tolerance, it was felt that no number at all would be preferable to a bad or misleading number.

It is emphasized that emission tolerance is a region-wide calculation. This tolerance obviously makes more sense in, say, an urban AQCR with many closely spaced emission sources than in a largely rural AQCR with geographically dispersed emissions.

¹Low concentrations of pollutants probably indicate a low density of sources and that the air quality monitors are not located near the sources. Thus changes in emissions from the sources will not result in a linear change in air quality readings.

Table A-1 Territory of Guam Air Pollution Control Areas

AQCR	Federal Number	Priority Classification ^a Part. SO _x NO _x	Demographic Information			Proposed AQMA Designations ^b		
			Population 1970	Square Miles	Population Density	TSP Counties	SO _x Counties	NO _x Counties
Guam	246	II III III	84,996	209	406.7	(0)	(0)	(0)

^a Criteria based on maximum measured (or estimated) pollution concentration (in $\mu\text{g}/\text{m}^3$) in area

Priority	I		II		III	
	Greater than		From-to		Less than	
Sulfur oxide						
Annual arithmetic mean	100		60-100		60	
24-hour maximum	455		260-455		260	
Particulate matter						
Annual Geometric mean	95		60-95		60	
24-hour maximum	325		150-325		150	
Nitrogen dioxide	110				110	

^b Federal Register, August 1974, SMSA's showing potential for NAAQS violations due to growth

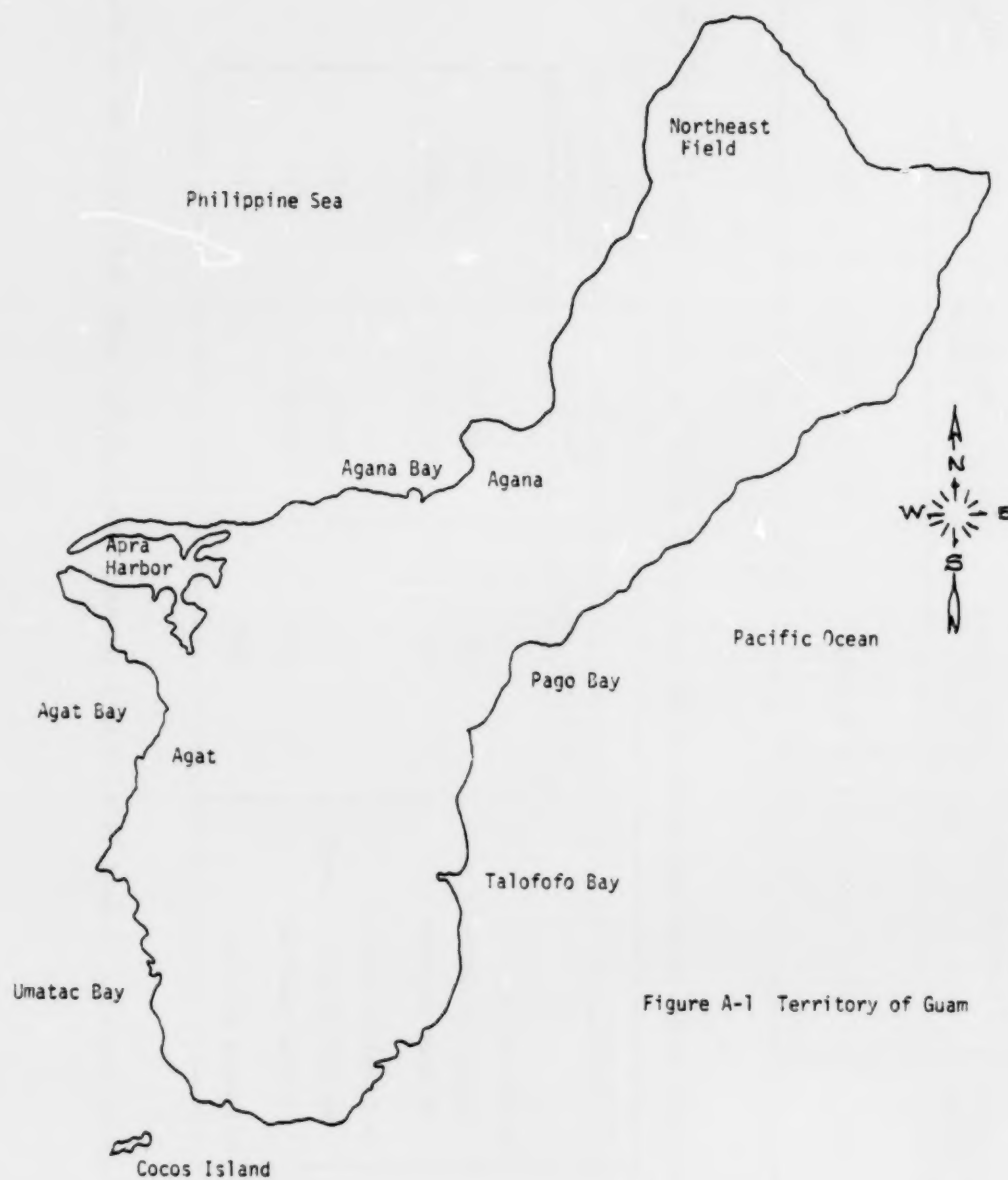


Figure A-1 Territory of Guam

Table A-2 Attainment Dates

AQCR #	AQCR Name	Particulates Attainment Dates		Sulfur Dioxide Attainment Dates		Nitrogen Oxides Attainment Dates
		Primary	Secondary	Primary	Secondary	
246	Guam	a	a	7/75	7/77	a

^a Ambient air quality was estimated to be below NAAQS at the time the SIP was written

Table A-3 Territory of Guam Ambient Air Quality Standards

All concentrations in $\mu\text{g}/\text{m}^3$

		Total Suspended Particulate ^b		Sulfur Oxides			Nitrogen Dioxide
		Annual	24-Hr.	Annual	24-Hr.	3-Hr.	
Federal	Primary	75 (G)	260 ^a	80 (A)	365 ^a	----	100 (A)
	Secondary	60 (G)	150 ^a	---	---	1300 ^a	100 (A)
Territory		60 (G)	150 ^a	60 (A)	260 ^a	1300 ^a	100 (A)

^a Not to be exceeded more than once a year

^b The Territory also has an 8 hour TSP standard of $360 \mu\text{g}/\text{m}^3$
 (A) Arithmetic mean
 (G) Geometric mean

Note: The federal secondary TSP standard of $60 \mu\text{g}/\text{m}^3$ is only a guideline standard.

Table A-4 Territory of Guam AQCR Air Quality Status, TSP ^a

AQCR Name	AQCR #	# of Stations Reporting	TSP Concentration ($\mu\text{g}/\text{m}^3$)			2nd Highest Reading 24-Hr.	# of Stations Exceeding Ambient Air Quality Standards						% Reduction Required to Meet Standard
			Highest Reading		Annual		Primary		Secondary				
			Annual	24-Hr.			Annual	24-Hr. ^b	Annual	24-Hr.	24-Hr. ^b		
Guam	246	3 ^d	172.2	628	423	N/A	N/A	N/A	N/A	N/A	N/A	85 ^c	

^a 1973 air quality data from Territory of Guam Environmental Protection Agency

^b Violations based on more than one excess of the standard

^c Calculated from: Highest Annual Reading - Annual Secondary Standard
Highest Annual Reading - Background

NOTE : Annual background taken from the SIP and equals $40 \mu\text{g}/\text{m}^3$.

^d Permanent stations

N/A = Not available

Table A-5 Territory of Guam AQCR Air Quality Status, SO₂^a

AQCR Name	AQCR #	# of Stations Reporting 24-Hr. (Bubbler)	# of Stations Reporting (Contin.)	SO ₂ Concentration (µg/m ³)			# of Stations Exceeding Ambient Air Quality Standards			% Reduction Required to Meet Standard
				Highest Reading		2nd Highest Reading 24-Hr.	Primary Annual 24-Hr. Secondary 3-Hr.			
				Annual	24-Hr.					
Guam	246	3 ^d	0	56.2	3497	3000	N/A	N/A	N/A	88 ^c

^a 1973 air quality data from Territory of Guam Environmental Protection Agency

^b Violations based on more than one excess of the standard

^c Calculated from : 2nd Highest 24 hour Reading - 24 Hour Standard
2nd Highest 24 hour Reading

^d Permanent stations

N/A = Not available

Table A-6 Territory of Guam Fuel Combustion Source Summary

AQCR	Power Plants	Other Fuel Combustion Point Sources	Total Fuel Combustion Emissions (10 ³ tons/yr)	
			Particulate	SO ₂
Guam	4 ^a	8	2.656	30.578

^a Includes only those which burn residual oil and are currently on line

Table A-7 Territory of Guam Emission Summary, Particulates ^a

	Total (10 ³ tons/yr)	Electrical Generation		Industrial, Institutional, Commercial Point Source Fuel Combustion		Area Source Fuel Combustion		Other Sources of Particulate Emissions	
		10 ³ tons/yr	%	10 ³ tons/yr	%	10 ³ tons/yr	%	10 ³ tons/yr	%
AQCR									
Guam	2.656	0.478	18	0	0	0.077	3	2.101	79

^a 1973 emissions from the Territory of Guam Environmental Protection Agency

Table A-8 Territory of Guam Emission Summary, SO₂^a

	Total (10 ³ tons/yr)	Electrical Generation		Industrial, Institutional, Commercial Point Source Fuel Combustion		Area Source Fuel Combustion		Other Sources of SO ₂ Emissions	
		10 ³ tons/yr	%	10 ³ tons/yr	%	10 ³ tons/yr	%	10 ³ tons/yr	%
AQCR									
Guam	30.578	29.6	96.8	0	0	0.337	1.1	0.641	2.1

^a 1973 emissions from the Territory of Guam Environmental Protection Agency

Table A-9 Territory of Guam Required Emission Reductions, Particulates

	From SIP			From 1973 Data				
	AQ Measurement Control Value ($\mu\text{g}/\text{m}^3$)	Emissions (tons/yr)	Allowable Emissions (tons/yr)	1975 Estimated Emissions After Controls (tons/yr)	% Reduction Required Based on 1973 AQ Data	1973 Emissions (tons)	Allowable Emissions (tons)	Emission Tolerance (tons/yr)
AQCR								
Guam	46.9 ^a	2,035	3,864	2,429	85	2656	398	-2258

^a Annual Geometric Mean (estimated)

Table A-10 Territory of Guam Required Emission Reductions, SO₂

	From SIP				From 1973 Data			
	AQ Measurement Control Value (µg/m ³)	Emissions (tons/yr)	Allowable Emissions (tons/yr)	1975 Estimated Emissions After Controls (tons/yr)	% Reduction Required Based on 1973 AQ Data	1973 Emissions (tons)	Allowable Emissions (tons)	Emission Tolerance (tons/yr)
AQCR								
Guam	59.3 ^a	21,701	29,276	29,260	88	30,578	3669	26,909

^a Annual Arithmetic Mean (estimated)

Table A-11 Territory of Guam Fuel Combustion Regulations

SO₂ : 0.80 lbs./ million Btu of heat input to the installation

Particulates : None

APPENDIX B

Tables B-1 and B-2 are the assessment of AQCR's which should be examined for the fuel switching impact in particulate and SO₂ emissions. They also provide an identification for those AQCR's which show little potential for fuel revision or regulation relaxation if ambient air standards are to be attained.

The criteria for candidates are (1) the severity and breadth of air quality violations, (2) the tolerance for emissions increases in the AQCR, (3) the fraction of total emissions resulting from fuel combustion and (4) AQMA designations. It should be noted that an AQCR may not necessarily need relaxation of regulations in order to accomplish fuel switching. Further, a good candidate in Tables B-1 and B-2 may later show little potential for fuel switching after individual sources are examined. Finally, it is possible that an AQCR may have air quality levels below standards at present and may require more strict regulations than currently exist if all fuel burning sources were converted to dirtier fuels, i.e., "average" emission rates now may be below "average" regulations.

Table B-1 Territory of Guam Candidacy Assessment for Revision of Particulate Regulations

AQCR	# of Monitors	# of Monitors with Violations	Expected Attainment Date	Counties with Proposed AQMA Designations?	1973 Total Emissions (tons)	% Emissions from Fuel Combustion	Emissions Tolerance (tons/yr)	Overall Region-wide Evaluation
Guam	3 ^b	3	a	No	2656	21	-2258	Poor Candidate

^a Ambient air quality was estimated to be below NAAQS at the time the SIP was submitted

^b Permanent stations

Table B-2 Territory of Guam Candidacy Assessment for Revision of SO₂ Regulations

AQCR	# of Monitors	# of Monitors with Violations	Expected Attainment Date	Counties with Proposed AQMA Designation?	1973 Total Emissions (tons)	% Emissions from Fuel Combustion	Emissions Tolerance (tons/yr)	Overall Region-wide Evaluation
Guam	3 ^b	c	7/75	No	30,578	97.9	-26,909	Poor Candidate

^a Ambient air quality was estimated to be below NAAQS at the time the SIP was submitted

^b Permanent stations

^c No violations were recorded at permanent stations; however, temporary stations have shown violations.

APPENDIX C

This section is a review of the individual power plants by AQCR. The intent is to illustrate fuel switching possibilities and SO₂ emissions which may result from these plants after fuel switching.

Table C-1 Territory of Guam Power Plant Analysis ^a

AQCR	Plant Capacity	Fuel Use ^b			Emissions ^b				1975 Emission ^c Limit SO ₂ (1b/10 ⁶ Btu)	Emissions Resulting After Fuel Switch SO ₂ (tons/yr)
		Type % S % A	Annual Quantity	Heat Input (10 ⁶ Btu/hr)	tons/yr		lbs/10 ⁶ Btu			
					SO ₂	Particulate	SO ₂	Particulate		
Guam	Piti 68 MW	Oil 3.1% S	48,466	832	11,795	193	3.24	0.053	0.80	2912
	Tanguisson 53 MW	Oil 3.1% S	32,180	552	7,097	128	2.94	0.053	0.80	1931
	Inductance Power Barge 28 MW	Oil 3.1% S								
	Cabras Unit #1 66 MW	Oil 3.1% S	16,654	286	4,053	66	3.24	0.053	0.80	1001
	Cabras Unit #2 66 MW	Oil 3.1% S								
On line : August 18, 1974										
Scheduled on line : May 1, 1975										

Table C-1 Territory of Guam Power Plant Analysis (continued)

- a Includes only steam electric plants using residual oil.
- b 1972 data from NEDS; oil use in terms of 10^3 gallons; heat content assumed to be 150,400 Btu per gallon; total number of hours of operation per year assumed to be 8760 for all plants.
- c SIP specified an emission limit for SO_2 only.
- d Calculated from:
$$\frac{0.80 \text{ lbs}/10^6 \text{ Btu}}{SO_2 \text{ emissions (lbs}/10^6 \text{ Btu)}} \times SO_2 \text{ emissions (tons/yr)}$$

APPENDIX D

The Territory of Guam was found to have no industrial, institutional or commercial sources which could be analyzed within the context of Section 4 of ESECA.

APPENDIX E

The Territory of Guam was found to have no area sources which could be analyzed within the context of Section 4 of ESECA.

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